

REMARKS

Reconsideration of the present application in view of the following remarks is respectfully requested.

I. Status of the Claims

Claims 1-18 are pending in this application, and are at issue. Claims 1, 3, 5, 11 and 12 have been amended by way of this response.

Claims 1, 3, 5, 11 and 12 have been amended to recite that the inorganic thin film has a thickness of from 0.1 to 500 nm. Support for this amendment is found in the specification as published at paragraph [0020].

No new matter has been added by way of this response.

II. Indefiniteness Rejection

Claims 1-18 are rejected for indefiniteness because the Examiner there it is not clear what is meant by the term “inorganic thin film” with regard to its thickness. In response, claims 1, 3, 5 11, and 12 have been amended to recite that the inorganic thin film has a thickness of from 0.1 to 500 nm. Thus, the rejection has been addressed and overcome.

III. Anticipation/Obviousness Rejections

Claims 1-10 and 13-18 are rejected under 35 U.S.C. § 102(b) as allegedly anticipated by Morihara et al. (JP 06-016848 (abstract); hereinafter the “Morihara abstract”), and under 103(a) as allegedly obvious over the Morihara Abstract. The Examiner asserts that the Morihara Abstract teaches a gas barrier film comprising a plastic film, such as polyethylene terephthalate, coated with a mixture of silicon oxide, magnesium oxide and sodium silicate, and further teaches that the amount of sodium silicate is from 0.1 to 10 weight percent. The Examiner contends that the limitation of treating the inorganic with the claimed solution is not afforded any patentable weight because it is a process limitation. Further, the examiner considers the limitations such as the

amounts of ion concentration to either be inherent or arrived at by routine optimization of a result effective variable.

In response, claims 1, 3, 5, 11, and 12 have been amended to recite that the inorganic thin film has a thickness of from 0.1 to 500 nm. Applicants respectfully submit that the Morihara Abstract does not teach or suggest a gas barrier film with an inorganic thin film having the claimed thickness. By way of this amendment, the Examiner's rejections are respectfully overcome.

Additionally, applicants respectfully submit that the process limitations should be afforded patentable weight because they provide a gas barrier film having novel properties. In the present invention, the solution which contains at least one ion species selected from the group consisting of alkali metal ions, alkaline earth metal ions, and ammonium ions is applied so that the so that the free ions (1) permeate the inorganic thin film and fill the spaces (holes and nanopores) in that film to inhibit gas permeation, and (2) decompose water molecule clusters to form monomeric water molecules that can permeate the film. Hence, the water molecules are able to combine with the thin inorganic film to form silanols, and can enter the spaces (holes and nanopores) inside the inorganic thin film, thereby preventing gas from passing through the film (*See* published application at paragraph [0050]).

In the Morihara Abstract, the compositions of an inorganic thin film, Si, SiO₂, and Na₂SiO₃ aqueous solution are mixed in advance. When these components are premixed, however, they do not spread uniformly over the film when sintered because the components have different melting points (i.e., Si: 1400 °C, SiO₂: 1650 °C, and Na₂SiO₃: 1000 °C). Further, when these components are vapor-deposited using an electron beam as described in Morihara, the sintered body is uneven and porous, and the components on/over the inorganic thin film are clearly uneven. Thus, the gas barrier effect is not efficient at least because the Na₂SiO₃ component does not efficiently fill the spaces in the thin film.

To the contrary, in the presently claimed invention, the coating process allows the free ions and water molecules to go uniformly enter the inorganic film to homogeneously provide a gas barrier effect not achieved in Morihara. Accordingly, the gas barrier film of the presently claimed

invention is not taught or suggested by Morihara. Thus, the process by which the claimed gas barrier films are formed provides a gas barrier effect superior to that of Morihara and it is therefore novel and non-obvious.

In view of the above amendments and remarks, it is respectfully submitted that the present claims are novel and non-obvious in view of Morihara. Withdrawal of the present rejection is respectfully requested.

Conclusion

In view of the above remarks, it is respectfully requested that the application be reconsidered and that all claims be allowed and the case passed to issue.

No fee is believed to be due with this Response. Should the U.S. Patent and Trademark Office determine that any additional fee is required, or that any refund is owed for this application, the Commissioner is hereby authorized and requested to charge any deficiency and/or credit any refund owed to Deposit Account No. 04-0100.

If there are any other issues remaining, which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

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Respectfully submitted,

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